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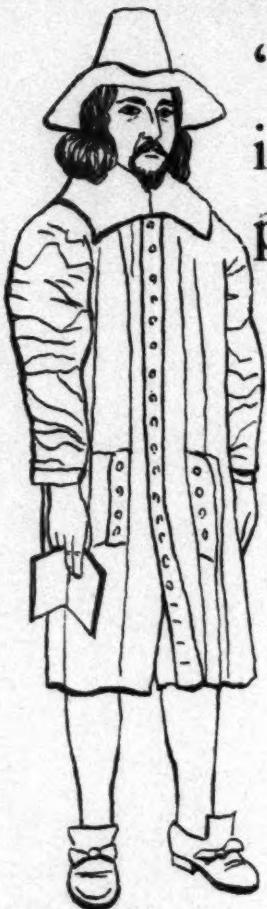
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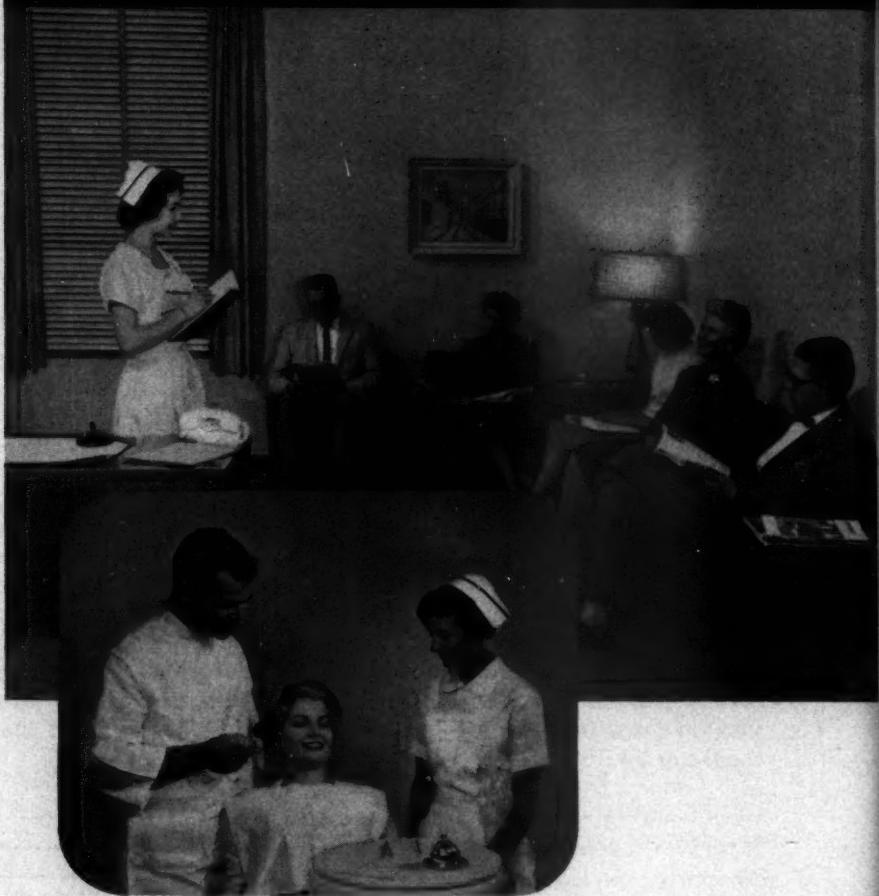
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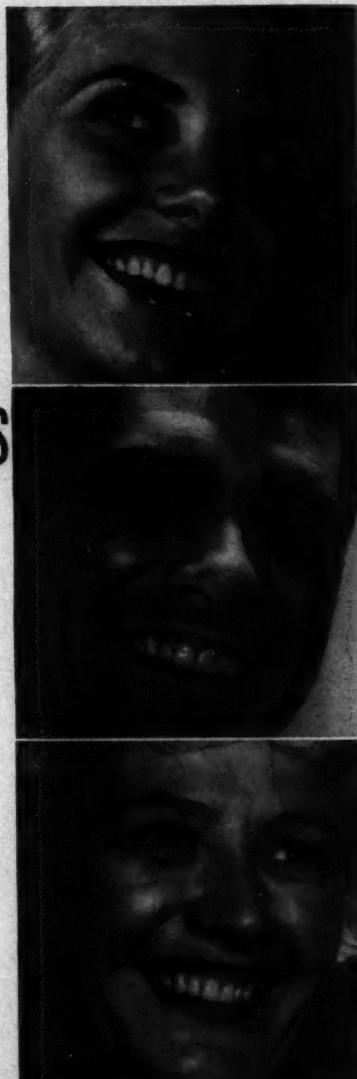
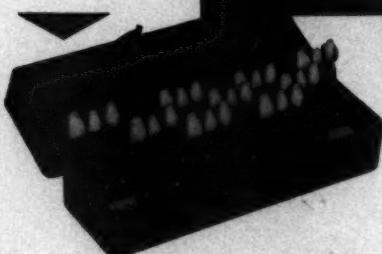
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The Fortnightly REVIEW OF THE CHICAGO DENTAL SOCIETY

Number 4
Feb. 15, 1961
Volume 41

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Forms close on the first and fifteenth of each month. The early submission of materials will insure more consideration for publication.

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The Fortnightly
REVIEW
of

THE CHICAGO DENTAL SOCIETY

February 15, 1961

Volume 41 • No. 4

Modern Concepts in Surgical
Preparation of the Edentulous Mouth*†

Stanley J. Behrman, B.A., D.D.S., New York, N. Y.

All surgery of the edentulous mouth for the reception of full dentures should be predicated on two concepts. The first is that of our changing population. Not a racial, ethnic or cultural change; not a change produced by a wave of immigration. Not even the constant economic change is of principal concern. The most important change concerning the dentist caring for the edentulous patient is the increased life span of



Dr. Behrman

each patient. The second concept is one of a more widespread knowledge, understanding and observance of the various principles of surgery as they apply. These principles may be newly-proved or they may be long-established. They must be appreciated in order to provide the edentulous patient with the basis for the efficient, esthetic, comfortable dentures he will need over his increased life span.

The tremendous scientific strides of the past two decades are responsible for this increased life expectancy. This does not mean that people will be living one hundred or one hundred and ten years. It does mean that many more people will be living through their sixth, seventh and eighth decades. It is the duty of our profession to contribute to the enjoyment of these years. Because every prosthetic replacement of a portion of the human anatomy is directly dependent on the foundation on which it must rest¹, the denture-bearing alveolar ridge must be available for a longer period of time. It is not enough to prepare the ridge for today's full denture—we must bear in mind the requirements of twenty or thirty or forty years of function.

Maintenance of alveolar height and contour should be the prime concern whenever a tooth is removed. After all, it has been said that, "The making of satisfactory artificial dentures begins with the extraction of the teeth"². Careful handling of the soft tissue; conservative, planned and delineated removal of bone; and, wherever possible, surgery of the tooth rather than of the alveolar bone, should be practiced. Studies have indicated that the use of absorbable gelatine sponge is very effective in the maintenance of ridge contour following the ex-

*From the Department of Surgery, The New York Hospital-Cornell Medical Center.

†Presented before the Mid-winter Meeting of the Chicago Dental Society, February 8, 1960.

(The author is a graduate of the School of Dentistry, University of Pittsburgh and received postgraduate training in oral surgery at the New York Hospital-Cornell University Medical Center.

Dr. Behrman is Assistant Professor of Clinical Surgery at Cornell University Medical Center, Associate Attending Oral Surgeon at the New York Hospital, Assistant Clinical Professor of Dental Surgery at Albert Einstein College of Medicine, and is Instructor in Oral Surgery and Implantation of Magnets, Postgraduate Department, First District Dental Society, New York. He is Secretary of the Foundation for Visual Education in Oral Surgery, is an Associate Council Member of the New York Institute of Clinical Oral Pathology, and is a Fellow of the American College of Dentists and of the New York Academy of Dentistry.)

traction of teeth³. The proper use of this material should be routine. The soft tissues must be handled discreetly. Attempts should be made never to retract the periosteum to the muco-buccal fold. To do so may result in a loss of ridge height during the attempt to improve ridge contour.

Above all, surgery of bone, or soft tissue resting on bone, should be kept to a minimum. Any surgery, no matter how minimal, produces bone resorption. A most significant study in this regard was reported by Stanton⁴. He performed an alveolectomy on a mandible that had been edentulous for twenty-one years. Thin cortical bone and underlying cancellous bone were removed in the anterior region. Dense cortical bone, "hard as a rock", was altered in the posterior. A direct impression was taken and a metal casting made. Two and one-half months later the bone was denuded, another impression taken and a new model poured. The original casting, which fit accurately at the time of surgery, now had "no stability at all". Significantly, resorption occurred even in area of the densest cortical bone. Stanton noted that ". . . a mere reflection of mucoperiosteum is sufficient to produce resorption in some cases." His study also indicates that this hastened resorption occurs over a period of three and one-half to six months; such changes should be anticipated following surgery of any degree.

The practitioner making the dentures must direct the surgical preparation of the mouth. Each case must be planned and the surgical procedures outlined beforehand. This applies whether the prac-

titioner performs the surgery himself or refers it to a specialist. It is a surgeon's responsibility to see that no procedures are undertaken without prior consultation with the man making the dentures. In truth, the surgeon is but an engineer. He must devise the methods and carry out procedures to produce the end result desired by the architect. The architect is the practitioner who will make the dentures. He must indicate the contour and configuration of the foundation he desires.

The extraction of teeth, alveolotomy and alveoplasty are taught in every dental school. Other than the previously made admonitions we need devote little attention to these procedures in this paper. The fact that the majority of the estimated 21,600,000 edentulous patients in this country apparently are fitted with dentures that are functional, comfortable, esthetic and secure⁵, speaks well for the surgical and prosthetic services our profession is providing. Our particular attention should be devoted to procedures which can be applied to the "problem" edentulous mouth. What is meant by the "problem" edentulous mouth? Anatomically, there is little or no alveolar ridge. The peripheral borders of the planned dentures are limited by the conspicuous attachment of certain muscles⁶ and the presence of prominent fibrous tissue bands. It is not uncommon to find no muco-labial fold or vestibule, enormously enlarged or hypertrophied sublingual glands and elimination of the retro-mylohyoid space when the tongue is thrust forward⁷.

There are several procedures which have been developed, or are under development, towards the solution of the problems presented by these edentulous mouths. These are: (1) Creation of a deep muco-labial sulcus. (2) Maintenance of the retro-mylohyoid space. (3) Removal of hypertrophied sub-lingual glands. (4) Creation of transverse ridges to improve denture stability. (5) Two implant technics. Remember that all of these procedures have either been devised at the specific request of prosthodontists or stimulated by an appreciation of the problems facing the practitioner who must construct the dentures.

Creation of a Deep Muco-Labial Sulcus

Were we to have within our means a method of increasing the height of the alveolar ridge by the addition of some material, which would be physiologic and which would withstand the stresses of mastication, our problem would be minimal. Unfortunately, none of the materials which have been tried to date have proved successful. Neither inert materials^{5,8}, nor grafts of aorta, cartilage or bone, have withstood the test of any degree of time⁹. Fortunately, there are procedures which seemingly increase the height of the ridge by deepening the sulci. A deeper muco-labial sulcus can be obtained only by freeing from the mandible muscle and connective tissue attachments. The simplest technic would seem to be to pass a knife through the sulcus to the desired depth, place an elongated denture into the area and wait for epithelialization to occur. This may seem like a simple procedure. However, a fundamental principle of surgery is that raw surfaces on soft tissues contract substantially during healing. This healing is apt to produce dense fibrous scarring. This means that as the raw wound produced with this technic healed, it would contract and, in large measure, reduce the depth of the new sulcus. In addition to this disadvantage of contraction during healing, this technic leaves two large, raw, uncomfortable surfaces to epithelize.

A somewhat similar technic was reported recently where the periosteum and soft tissues were stripped from the ridge to the desired depth and an elongated denture placed over the denuded ridge¹⁰. While the periosteum is used to cover the raw lip surface, the entire alveolar ridge is exposed. We all know how long it takes bone to cover with granulations, and how painful the denuded bone is.

Another technic involves incising in the shallow sulcus and undermining the lip mucosa. The sulcus is deepened and the mucosa is brought to its depth. It is held in position by sutures through to the skin¹¹. The sulcus is deepened by freeing the connective tissue and muscle attachments from the periosteum. The periosteum is left to granulate over. Two disadvantages occur with this technic. The first is that scarring will occur in the precise depth of the muco-labial sulcus leaving a dense fibrous band. This will not provide as flexible a muco-labial fold as is desired by the prosthodontist in order to offer the best peripheral seal. The second is that the raw surface of the periosteum remains quite uncomfortable until it is completely epithelized.

Without question, the most significant technic advanced for the extension of the muco-labial sulcus is that developed by Kazanjian¹². In this technic, a horizontal incision is made on the inner surface of the lip, approximately 1.5 cm from the alveolar bone. The mucosa is dissected free as far as the periosteum. The muscles and connective tissue are freed from the periosteum to the new depth of ridge. The mucosal flap is brought down and sutured, thus covering the newly exposed periosteum. The remaining portion of the lip mucosa is undermined, brought to the depth of the new muco-labial sulcus and sutured in position, thus covering the raw lip surface. Sutures then are passed from this point to the skin surface where they are sewn around a roll of gauze or rubber tube. With this technic there are no raw surfaces to granulate in. Scarring does occur, however, in the depth of the muco-labial sulcus.

We employ a modification of the Kazanjian technic. It eliminates the use of sutures through to the skin and it moves the scar line from the depth of the muco-labial sulcus further onto the lip. It allows for flexibility in the depth of the sulcus permitting a better peripheral seal.

1. The lip is held forward and an estimate is made of the amount of mucosa which will be necessary to cover the exposed periosteum, extend to the depth of the new muco-labial sulcus, and then extend upward onto the raw lip surface. A semi-lunar incision then is made, being particularly careful to note the presence of the mental neurovascular bundles.

2. The mucosa thus outlined is dissected to its attachment to the periosteum. (This dissection can be facilitated by the "ballooning" of the tissues with local anesthesia.)

3. The muscle attachments (mentalis and some of the incisivus labii inferioris, if this is being done on the mandible) and connective tissue are freed from the periosteum. Care is taken that the periosteum is not torn. This dissection is carried down to the desired depth of the new muco-labial sulcus.

4. The previously freed mucosal flap is brought over the denuded periosteum and sutured with fine gut to the depth of the muco-labial sulcus. Mattress type sutures, biting well into the periosteum, are used. This should be done in a manner that will leave a small "apron" of mucosa approximately 3-4 millimeters in width. This apron extends up onto the raw lip surface.

5. The remaining portion of the lip mucosa is undermined.

6. The margin of the newly undermined lip mucosa is brought to the edge of the apron and sutured both to the apron and to the sub-mucosal tissue. Scarring, when it occurs during healing, will be along this line and not in the depth of the muco-labial sulcus.

7. The patient's denture is placed in the mouth with self-cure acrylic added to maintain the depth of the new muco-labial sulcus. (If there is no denture, a previously constructed splint is utilized.)

8. It is advisable to keep a head-chin bandage in place for twenty-four to forty-eight hours. With this technic there is: (1) Good depth of the muco-labial sulcus. (2) The depth obtained at the time of surgery is maintained. (3) Scarring is not in the depth of the muco-labial sulcus. (4) There are no raw areas to heal. (5) There are no through and through sutures to the skin. It should be noted that similar procedures can be utilized to extend the muco-lingual sulcus in the anterior region.

Maintenance of the Retro-Mylohyoid Space

It has been noted that the retro-mylohyoid space, lingual to the retro-mylohyoid pad, often is eliminated by a forward and sideward thrust of the patient's tongue⁷. Two surgical technics have been advanced to overcome this problem. The first¹³, similar to the previously mentioned technics for extension of the muco-labial sulcus, has the disadvantages of raw periosteal surface and skin sutures. The second¹⁴ is the technic most applicable to this area today. It involves an incision along the crest of the ridge to the bone and elevation of the mucoperiosteum. The mylohyoid shelf of bone is trimmed off. The periosteum is freed to the lower border of the mandible. The original incision is closed and a rubber catheter is placed deep down in the muco-lingual sulcus and sutured through to the skin. This catheter is kept in place for one week in order to produce fixation to this new depth. My personal experience has been that in some patients, if there has been enough scarification of the tissue, the depth of the new muco-lingual sulcus will be maintained. In many other patients the tissue resumes its normal flexibility and elasticity and, although we have gained the advantage of not having a sharp mylohyoid shelf, we still lose the retro-mylohyoid space when the tongue is extended.

At the present time we are conducting animal experiments with a variety of sclerosing solutions. These are injected

into the flexible and movable tissue in the retro-mylohyoid area. The amount of tissue rigidity thus obtained is being evaluated. It is hoped that we will be able to develop a rather simple technic which will bind down the tissues yet not interfere with their physiology nor their ability to withstand denture-bearing stresses.

Removal of Hypertrophied Sub-Lingual Glands

There are certain instances where large hypertrophied sub-lingual salivary glands present a substantial problem to the prosthodontist⁷. These glands overfill the mylohyoid or sub-lingual space and contribute to denture displacement. These glands, you may recall, are the smallest and least productive of the three pairs of salivary glands emptying into the mouth. It is estimated that they contribute about one-tenth of the total of salivary secretion. (In addition, lubrication of the oral cavity is enhanced by myriad secretory glands in the mucosa of the cheeks, lips and palate.) A number of prosthodontists have requested that these glands be removed in order to eliminate their obliteration of the sub-lingual space. These glands can be excised under local anesthesia as an office procedure. Care must be taken not to interfere with Wharton's duct extending from the sub-maxillary gland or the lingual nerve which crosses from the medial portion of the mandible to the tongue. The tissues must be handled tenderly, the dissection carried out with care, and all vessels meticulously tied off. Otherwise edema in this region may be substantial with considerable patient discomfort. It is suggested that the glands be removed from one side at a time.

Transverse Grooves Across the Alveolar Ridge

An excellent example of the prosthodontist functioning as an architect is in the creation of transverse grooves across the alveolar ridge in order to improve denture stability. It has been noted that

sometimes when there is sufficient alveolar ridge so that retention is not a problem, there is a problem of side-to-side shifting and of "tipping" of the denture. Klein¹⁵ has suggested that this could be overcome by the creation of grooves through the alveolar ridge in the first molar region. These grooves almost lock the denture in place, preventing tipping, side-to-side shifting, and enhancing retention. In this technic, an incision is made along the crest of the ridge, through the mucoperiosteum which is then carefully reflected and held with retracting sutures. A groove, approximately five millimeters wide, is created by removal of alveolar bone from lateral to medial (buccal to lingual) surfaces. This is carried approximately two millimeters deeper than the muco-buccal sulcus. The mucoperiosteal flaps are then incised in "barn-door" fashion. (A vertical incision in the midline of the groove and horizontal incisions to the edges of the groove.) The "barn doors" then are closed, protecting the proximal bony surfaces. Self-cure acrylic extensions are placed on the patient's denture and the denture placed in the mouth. Follow-up of almost three years has shown no significantly increased resorption in the area of this surgery. The patients have reported substantial improvement in denture function.

Semi-Buried Implants

The technic which has unquestionably received the most widespread attention in recent years in its attempt to overcome the problems of the ridgeless, edentulous mouth, has been the semi-buried, or Vitallium implant¹⁶. In this technic, the mucoperiosteum is reflected and a direct impression is taken of the bone. A framework of tissue-tolerated metal is placed on the bone and covered with mucoperiosteum except for four posts which protrude through the soft tissue into the mouth. Onto these four posts is placed a denture. Long-term evaluation of this technic has shown that in a too-large

(Continued on page 30)

News and Announcements

DENTAL PSYCHOSOMATICS MEETING

There are three more meetings remaining in the workshop on Patient Management presented by the Academy of Dental Psychosomatics—March 3, April 7, and May 5. Avail yourself of this opportunity to improve your relationship with your patients, especially the nervous and apprehensive ones, who can become your best and most appreciative patients, and your best boosters. A nominal charge is made to those who wish to help defray expenses, or, you are welcome to come out as the Academy's guest at the next meeting, if you wish.

The March 3rd program, which will take place on the second floor of Roosevelt University at 7:30 p.m., will feature Dr. Robert Atterbury on "Hypnosis in Clinical Dentistry and Oral Surgery," and Dr. S. W. Kleinman of Cleveland, Ohio, on "The Utilization of Hypnotic Time Distortion in Dentistry."

NORTH SIDE SELECTS SLATE OF OFFICERS

On Wednesday, January 18, the Nominating Committee of the North Side Branch of the Chicago Dental Society met to select a slate of officers for the coming year, 1961-1962. The Committee hereby submits the names of the men and the offices for which they were selected: President, William Semiloff; Vice-President, Raymond M. Bro; Secretary, Richard N. Pipia; Treasurer, Max Chubin; Librarian, Harry G. Greene; Branch Director, Stanley S. Goldberg; D.D.S. Director, Paul H. Brown.

NORTH SUBURBAN MARCH MEETINGS

The regular dinner meeting of the North Suburban Branch will take place on Tuesday, March 14th, at the Villa

Moderne. The speaker will be Dr. Arthur Kahn, of New York City. On Wednesday, March 15th, the Branch will hold its Spring Seminar, an all-day affair also featuring Dr. Kahn. Please turn to another page in this issue for advertisement giving further information.

CHANGE OF ADDRESS

Few members of the Chicago Dental Society are aware of the provisions of the Dental Practice Act which requires a dentist to notify the Department of Registration and Education of any change of address "within ninety days thereof." Failure to do so "shall work a forfeiture of such license, and no license, when once forfeited, shall be restored, except upon payment to the said department of the sum of fifteen dollars (\$15.00) for such failure." (Sections 6 and 8, *Illinois Dental Practice Act*.)

RICHARD FISCHL INTERVIEWED ON RADIO

Dr. Richard G. Fischl of Evanston, Chairman of the Adult Dental Health Education Committee of the Chicago Dental Society, and 1961 Midwinter Meeting Publicity Committee Chairman, was heard on a special radio interview on Station WJJD on February 1st. He was interviewed on the Midwinter Meeting and Children's Dental Health Day promotion in McCormick Place.

WEST SIDE MEETING AND ELECTION

The West Side Branch will hold its next meeting and annual election of officers on March 14th at the Midwest Athletic Club, 1 N. Hamlin Avenue. Mr. Waid R. Vanderpoel and Mr. William Nyman, of the First National Bank of Chicago, will talk on "Investment Planning."

News of the Branches

Englewood

All the news that's pit to print,
'Tis Boss Waska speaking quite forth-
rightly,
Saying "Charlie put a poem in print"
Or lose your job with THE FORTNIGHTLY.

Take your job and all its glory
Fight the pressure of the deadline.
You scrounge for news and write the story
I'll stick to women, song, and wine.

You tell of Meilach's fun in the sun
Of Theodorou's Midwinter Clinic
Of Jim Nowlan's daughter, the married
one.
I'll relax and snooze and play the cynic.

You tell of Scanlan's trip to old New
York,
Of Warady, Christopher, Reynolds, Bor-
gerding,
For myself I'd sooner talk of Spooner
There's a name that rhymes with any-
thing.

So take it, Waska, it's been fun.
Don't beg, entreat, or darken my door.
I've not the schoolin' to rhyme Vermeu-
len,
I don't want your *#%"%)(#'''* job
anymore!

Charlie Kresnoff, the Bard of 95th St.

South Suburban

Now that the Midwinter Meeting is over and everyone has absorbed all the knowledge from the seminars, essays and clinics we will get back to work with new enthusiasm and determination to do better dentistry and render a better service to our patients. In our profession we never stop increasing our knowledge and should never stop studying in order that we may keep up-to-date with new materials, new techniques and new develop-

ments in the field of dentistry. . . . Beside the "Big" meetings like the Midwinter Meeting, there are the monthly Branch meetings which you all should attend. The programs which have been presented so far have been not only informative but interesting. The flow of knowledge is there to be received but you must be there. Our attendance has been very good, in fact excellent. Approximately 60% of the membership are regular attenders. Let's try to increase this to 80%. I think Steve Lynch has done a tremendous job in presenting the programs which have been of interest to all. Plan now to attend the remainder of the meetings, March, April and May. . . . It may be a little premature to mention the golf outing since there is still snow on the ground but June is not far off. Dust off the old putters and try out the living room rug. . . . I would also like to congratulate Myron Bardige on the excellent job he has done for our Branch this year. Among his accomplishments are, the Constitution, now drawn up, passed on by the Board of Directors and now in print for distribution to the membership to be voted on at the March meeting. Please read this over before coming to the meeting so it can be discussed, questions answered and passed on. The Bloom Junior College course for Dental Assistants is one of Myron's accomplishments. This has been a wonderful help to the men in this area as we now have a supply of girls who are trained in assisting at the chair. Finding office personnel has always been a problem. The latest project by Myron is the formation of an Outpatient Clinic at St. James' Hospital. The groundwork is now underway and sometime in the near future he hopes it will be a reality. Speaking for all the members of the Branch we express our thanks and appreciation for a job well done. . . . The first Tuesday in March will feature Allen Doner as our speaker at the regular meet-

ing. His topic is "Diagnosis: Essential Factors in General Practice" and will be of interest to all. . . . Park Forest will hold its annual Dental Health Week the latter part of February. Don Murphy is Chairman and anyone interested should call him. This program is put on in the schools by local dentists showing films and discussing children's dental health.—*Thomas R. Case, Branch Correspondent.*

West Suburban

Our next regular meeting will be the annual Clinic Night held at the Oak Park Club on Tuesday evening, March 14th. Chairman Bill Stoffel states that his selected clinicians, representing all three local dental schools, will present a great variety of diversified informative material. . . . Round Table will meet Monday noon, March 6th, featuring a program on Swisseident Teeth. . . . Next meeting of Far West Study Club will be Thursday evening, March 22nd, at Louis' Restaurant. Dr. Richard Tiecke will lecture on Oral Pathology. . . . Oak Leaf Study Club will continue with their compact schedule on Friday, February 17th, featuring Dr. Hugo Del Rossa, speaking on Cavity Preparations. . . . The MacNeal Memorial Dental Staff, under the chairmanship of Barney Siegrist, has been meeting monthly featuring discussions and programs designed to acquaint the general practitioner and specialist with the purpose, requirements, benefits, and procedures of Hospital Dental Services. . . . Understand Al Kuncl is vacationing down in Florida—a timely venture I would say. . . . Congratulations to Joe Krizek, John O'Connell, Bill Aquilino, Lyle McDonald and Joe Bone on the making of a closed retreat at Barrington. . . . Congratulations to grandfather, LeRoy Sanden, on the birth of a grandson. LeRoy has been overwhelmed with joy, for his daughter and son-in-law who have been in Germany for some time are returning to the states, whereupon his son-in-law will join the University of Wisconsin Faculty as a language profes-

sor. . . . The Far West Study Club is announcing its Second Annual Meeting at Wagon Wheel Lodge in Rockton, Illinois. This will be a three-day affair of funning and learning for wives as well as husbands. Guest speakers will be Dr. Lester W. Boyd and Dr. Anthony Gargiulo who will center their discussions on occlusal equilibration and its periodontal considerations in full mouth rehabilitation. All interested in this gala event, contact chairman, Frank Novak, who will inform you of his "Package Deal." . . . Once again would like to close with a "Perry Dentist" quotation: "Iron rusts from disuse, water loses its purity from stagnation and in cold weather becomes frozen; even so does inaction sap the vigors of the mind."—*Joseph V. Discipio, Branch Correspondent.*

North Side

President, William Semiloff; Vice-president, Raymond M. Bro; Secretary, Richard N. Pipia; Treasurer, Max M. Chubin; Librarian, Harry G. Greene; North Side Director, Stanley S. Goldberg; C.D.S. Director, Paul H. Brown. This is the official slate proposed by the Nominating Committee of the Branch which held its annual meeting on January 18th. The election of officers will take place at our next regular meeting on March 14th. Having served on this committee for the past six years, I invariably go away with the feeling that our final choices for officers of the Branch have been made with very thorough consideration of the great wealth of active membership. I am also proud of the teamwork and feeling for the best interests of the Branch; some of our present officers are giving up their prerogative of succession of office to permit other active and desirous members to serve. Haphazard succession of office has never been the routine of our Branch in the last eight years. A man qualified for one office may not be qualified or desirous of another. Among these magnanimous individuals is Ruby Kadens our Vice-

President, who stated that he would accept the nomination for the presidency if drafted; however, he knew other qualified and anxious men on our Board. As Chairman of the Board he ran a series of outstanding meetings this past year with much accomplished in short order. Another of our fine officers to relinquish his prerogative of succession is our very efficient Treasurer, Bill d'Autremont who, to the disappointment of the Committee, felt that with all the good executive qualities of the other officers, the Branch should have a President or Vice-President of better administrative qualities than he could provide at this time. Both Kadens and d'Autremont are men of exceptional capabilities and will, because of their continued interest, be again asked to serve the Branch in the future. Jules Barrash, whose 3-year term as Director is terminating, is to be commended for his many years of service on the Board. As Chairman of the Branch Ethics Committee for the past four years he has been a valuable asset to the C.D.S. Ethics Committee and is responsible for maintaining and enhancing the high standards of our Society. Jules has outlined an excellent list of objectives for our Branch and all of organized dentistry which I hope to present to you in a future column. . . . Nancy O'Shea, assistant to Abe Hoffman, and Merle Chubin, daughter of Max, were capped on January 19th at the Palmer House. They passed the American Dental Assistants' Certification Board. . . . Don't fail to make your reservations with Joel Arnold, LA 5-2737, for the Uptown Forum Oakton Resort Weekend on March 24th! . . . Reserve now with Max Chubin, JU 8-6600, for N. S. Workshop presenting Arthur Elfenbaum on "Diagnosis, Dental, Medical through Observation and X-Ray," March 8th and 9th. . . . Hal Gerstein has been appointed Assistant Professor of Endodontics at N. U. Dental School. . . . Ask Harold Brill how he got that black-and-blue left thumb! . . . Sam Goffen enjoyed an extensive Mexican vacation. He received a citation from the Mexican Dental Society for his talk.

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Sam, who will clinic in Detroit and Minneapolis in April, is writing a book. . . . Milt Eagle of United Dental Lab recently lost his mother. Our heartfelt sympathies. . . . Brethold Schulz writes Earl Elman that he is mountain climbing in Afghanistan. . . . Ron and Sondra Nierenberg are proud parents of Iris, born on December 28th. . . . Marvin Berman is working toward his master's in Pedodontics at University of Illinois and working part time on children at 2514 Devon.

—Paul Brown, Branch Correspondent.

dear friends: "Thank you one and all." "I never realized how widely read this column is." The real truth of the matter is, nobody called me for news and Larry Johnson was the only one who missed the article. I can dream, can't I? . . . Are you interested in the Psychologic Basis for the Management of Children? This was the subject discussed in a seminar held at the Zoller Clinic at the University of Chicago conducted by our own Kenwood-Hyde Park member, Stanley Korf. . . . Art Block and Harold Stackler recently attended the Angle Society Orthodontic meeting held in Cleveland, Ohio, and picked up many angles (that's "les" not "els"). . . . Be sure to watch for a Special Program to be held at the Wagon Wheel Resort in Wisconsin, April 12th and 13th, sponsored by the American Society of Dentistry for Children. You will hear more about this soon, but scratch out the date in your appointment book. . . . "Blooper" night turned out to be a very successful evening. This was an evening arranged by Stanley Korf for essayists and clinicians to tell us, not about their successes, but about their "Bloopers." Dr. Maurice Falstein, the outstanding clinician in full mouth reconstruction, Dr. Harold Gerstein, Assistant Professor of Endodontics at Northwestern University Dental School and Dr. Norman Olsen, Associate Professor and head of the Department of Pedodontics at Northwestern University Dental School were the guests who admitted publicly their "Bloopers." This was a

(Continued on page 28)

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Why Do Amalgam Restorations Fail?

Ray Hailey, Jr., D.D.S., Denver, Colorado

(Dr. Ray Hailey, Jr. was graduated from the University of Kansas City in 1946. He is President of the Dental Alumni Association of his alma mater. He is a member of the Academy of Restorative Dentistry, of the Academy of Gold Foil Operators, and of the Academy of Dental Practice Administration, and he is a Fellow of the Federation Dentaire Internationale.)

It is said that approximately 80 per cent of all restorations placed in the mouth today are that of silver amalgam. Yet it is still the most abused of all dental materials. Little or no degree of skill or care need be exercised to produce a restoration which will render some service, in many instances a surprisingly long service. This sample amalgam restoration was placed 35 years ago with a poor technique compared with what we

know as an acceptable technique today. This restoration has survived and is still giving a good service. This is only one example out of probable millions, hundreds of which you have observed in your own office. If this be the case, what might we expect from amalgam if we apply more sound and scientific principles in the use of this material than was known and practiced 35 years ago? Our successes might well be phenomenal, and our failures few.

In order to insure this success one must approach the amalgam restoration with a sound cavity preparation and thorough knowledge of its physical properties. The correct manipulation of the material as we know it today and its limitations should be of supreme importance to every careful operator. Yet today with much

new knowledge available concerning silver amalgam, few men in our profession bother to improve their amalgam technique. Yes, it's true the material is probably misused and abused more now than ever. Many feel that amalgam is a second-rate filling material as compared to a gold casting and use a second-rate technique in handling same. Amalgam is presented and sold to the patient with the same philosophy. Gold is the best and silver is next, a statement used every day in case presentation. The truth of the matter is that both types of restorations have their particular place in complete dental service. As indications dictate, both can and must render an equal service. However, one fact is evident: amalgam saves more teeth from the extractionist than gold inlays ever have. The perfect inlays are few and far between. We know that if an inlay's margins do not simulate that of gold foil, we are asking for disaster. Caries under a gold casting is usually cause for alarm. Yet caries under amalgam is usually far less serious and much less likely. We must assume human errors will show up in any restoration, but the gold casting can tolerate far less error in the finished product than that of amalgam. This should not condone a sloppy amalgam technique in the eyes of a conscientious operator. It must be realized that it is only with the use of sound procedures and techniques that the ultimate in an amalgam restoration can be obtained.

Healey and Phillips found in examining 1526 amalgam failures, 56% were due to faulty cavity preparation, 40% were traced to improper manipulation.

*Presented during the Midwinter Meeting of the Chicago Dental Society, February, 1960.



Dr. Hailey

Sixteen percent of this 40% may be accounted for by moisture contamination. Since faulty cavity preparation is responsible for the highest percent of amalgam failures it behooves all of us to review, again and again, sound basic principles for proper cavity preparation. All of us should know and practice conscientiously these fundamentals, but unfortunately this is not the case. It was observed that 40% of the State Board applicants in Colorado last year did not place proximal retention in their amalgam preparations. An indication that fundamentals are soon forgotten. In preparing what is generally considered a proper Class II, the outline forms of both the proximal and occlusal are of the utmost importance. Proper extension for prevention is still a cardinal rule but small burs are used to accomplish this on the occlusal surface. Most occlusal cutting should be done with burs not larger than a 700 tapered fissure. The finished occlusal opening should be kept as small as possible, in the majority of cases not larger than the width of a 701 bur. Naturally the occlusal walls should follow the enamel rods.

The proximal outline should carry the margins into self-cleansing areas. A triangular form is achieved which will enable a very thin Wedelstaedt chisel to pass between the margin and the approximating tooth. Of course, any weak enamel rods must be removed. Looking from the occlusal, it is necessary that the walls follow the enamel rods and do not flare out unnecessarily. A wall of this kind leaves a weak amalgam margin. Only with bulk does amalgam have strength.

With cutting instruments running at speeds of 200,000 rpm, it becomes increasingly difficult to cut conservative cavities. However, conservatism may be attained by using small instruments throughout the preparation. Time is no factor here as even the smallest bur will cut faster than most can think. With the air turbine, three burs are necessary to properly cut the average Class II. They are number $\frac{1}{2}$ round, 669L and a 330.

The Class II is opened with a number $\frac{1}{2}$ round. The occlusal is run out with a

669L, being sure to follow the direction of the enamel rods. This should leave the occlusal opening about $\frac{1}{2}$ the width of the floor. The proximal enamel is undermined with the same bur. The enamel is then removed with a spoon excavator and the walls, buccal and lingual, are extended to a self-cleansing area with a very thin Wedelstaedt chisel. All weak enamel rods are removed on the occlusal with the same chisel. The removal of frail enamel can only be accomplished with a chisel and failure to do so or the relying on rotary instruments to accomplish this procedure will invariably cause an open margin. A dam is placed at this point and the remainder of the preparation is finished with only air as a coolant. A wedge is placed at the gingival to prevent the cutting instruments from engaging the dam. Research by Guard and Ireland has told us round angles are much better than acute for both condensation of amalgam and stress factors. The small 330 bur will leave round angles throughout the preparation. Any weak enamel remaining at the gingival margin is removed with an enamel hatchet creating a flat gingiva seat with a slight gingival bevel in some cases. The proximal locks are placed last with a 669L. They should be placed entirely in dentine and should be to a depth of at least the diameter of the bur. The groove may or may not extend to the occlusal surface, but should at least approach the occlusal. Any remaining caries is removed with spoon excavators.

This type of preparation prevents unnecessary weakening of teeth so as to prevent splitting and fracturing. The fracture of cusps and the splitting of teeth into the pulp is minimized by conservative cavity preparation. The promiscuous cutting of sound tooth structure by the use of large cutting instruments not only subjects teeth to ultimate fracture but also leaves more amalgam exposed to occlusal stresses. Sound tooth structure is far stronger than amalgam. Amalgam confined in small cavities may be condensed far better than that in large preparations. Therefore, large occlusal forms do not necessarily promote strength and lon-

gevity in a Class II amalgam. A conservative outline form along with adequate proximal locks and an axial pulpal bevel are the primary prerequisites to a lasting restoration. Should cusps be weakened extensively by caries, they should be capped by at least two to three m.m. of amalgam. Amalgam is far stronger than enamel unsupported by dentine.

For many years dental schools have taught the importance of rubber dam in operative dentistry only to have most of their graduates leave and ignore its significance in private practice. The reason offered by most for this blight on operative dentistry is the time required to apply the dam. This is not a factor to those who do rubber dam dentistry since the average time of application is less than a minute. Operative dentistry is possible without the use of the dam but certainly better dentistry can be accomplished by its routine application. To further emphasize this, it must be recognized that vision is at least 30% better under a dam than without. Residual decay, decalcified enamel, weak tooth structure, and other flaws may often be overlooked unless a clean, dry field is maintained while perfecting the preparation and during final inspection. Rubber dam eliminates moisture contamination, the prime reason for expansion of amalgam and consequent failures. This accounts for failures not only in amalgam but in other restorative materials as well. Gold foil, silicate cements, oxyphosphate cement, are highly susceptible to minute amounts of moisture with resulting deleterious effects on all. A contaminated amalgam may look satisfactory to the operator immediately after insertion. But a revelation will unfold during the ensuing months, a rather sickening one to be sure. A chemical action invariably takes place from within the mass, producing hydrogen gas and this in turn causes expansion, with resulting marginal flaws, corrosion, and pitting. What was once thought to be a successful restoration is now a failure. A longer working time is obtained by using rubber dam. Amalgam often requires much time to thoroughly condense in large restora-

tions and in those nearly inaccessible places of the mouth. A compound reinforced matrix may be used. This type of matrix may be used only under a dam since any moisture will prevent the compound from adhering to the teeth. Certainly when rubber dam becomes more universally used by the profession, the quality of operative work will greatly improve.

Much has been said concerning sterilizing agents and bases over the years. We now know dentine cannot be effectively sterilized with present-day medicaments. The old stand-by AgNO_3 is a strong pulpal irritant and causes discoloration to surrounding tooth structure. Other agents such as phenol and alcohol are of no value as they will not sterilize dentinal tubules and act only as pulpal irritants. When rubber dam is applied, it is seldom necessary to use anything other than hydrogen peroxide. This will cleanse any organic material present in the finished cavity preparation.

Unless the preparation is a near exposure, the only insulation needed is several applications of copalite or some similar varnish. The use of large cement bases is the probable cause of many amalgam failures. Oxyphosphate cements have a crushing strength of 8000 lbs./sq. inch at best, as compared to amalgam which has around 50,000 lbs./sq. inch. Amalgam which rests on a material as soft as cement is most certainly subjected to strains which invite fracture, flow, leakage, and ultimate failure. The characteristics of amalgam make it imperative that it be placed on a sound foundation with adequate bulk and retention so as to withstand the forces of mastication. Cement along with CA OH_2 should be used sparingly only in those areas where the pulp is nearly exposed and cavity varnish applied to the remaining cut dentine. The varnish is applied with a very fine camel's-hair brush. Care should be exercised to keep the varnish off the cavity margins. Several consecutive coats should be applied allowing each to dry before the next application. Even the deepest cavity may be made immune to thermal shock by

this method. Research has shown copalite to be superior to most cavity liners available today. It has been demonstrated conclusively that amalgams placed over several layers of copalite show less penetration to radioactive isotopes than with any other type cavity liner tested. Oxyphosphate cement, ZnO and eugenol and polystyrene were found to be very poor in this regard.

There are probably as many different types of mechanical matrices as there are men to use them. With all that are available, none seem to satisfy the requirements of a proper matrix. This seems of little importance to many. The use of such a matrix explains why the average amalgam appears to be a poor restoration. It is assumed that its nearly universal use stems from its speed of application without due regard to its many inadequacies. Amalgam cannot be properly condensed nor can it be contoured to tooth form when a mechanical matrix is employed. Good condensation insures density to amalgam which is directly proportional to crushing strength and flow. A matrix that moves under pressure allows the amalgam to landslide. This moving of the amalgam during condensation prevents the different increments from thoroughly bonding—leaving the finished restoration weak and subject to fracture. A metal reinforced compound matrix eliminates the pitfalls of a mechanical matrix. This type of matrix will not move under heavy condensation pressure. The finished restoration will present a normal tooth contour. It may be closely adapted to the cavity margins so as to prevent an excess of mercury rich material out over the margins which cannot be condensed. Many matrices may be applied in the same quadrant at one time. They will not be in the way of the cheek, tongue or operator.

There are two types of matrices which eliminate the shortcomings of a mechanical matrix. They are .0015 stainless steel reinforced with compound and well fitted annealed copper bands reinforced with compound. The stainless steel may be secured to the tooth by dental tape. These

are made in advance and in many sizes. A piece of steel is cut to size and two holes punched with a rubber dam punch and the floss threaded through each hole. For a MOD matrix, three holes are necessary. Steel is then placed on a paper pad and burnished with a ball burnisher. This makes the steel convex which lends contour to the matrix. In many instances it is not necessary to use a tie on matrix as the steel may be held in place by the wedge while placing the compound. On multiple surface restorations, an annealed copper band is the matrix of choice. A band slightly smaller than the tooth is selected and is stretched and contoured with pliers so as to snug the margins and maintain proper tooth form. The contacts are thinned with a Joe Dandy disk and burnished with a ball burnisher.

A triangular shaped wedge should be used for all amalgams so as to preserve proper gingival contour and prevent unnecessary gingival overhangs. This type of wedge is best made from a round toothpick. A selection of many sizes should be made and stored for future use. After the matrix is either tied to the tooth and wedged, or just wedged, the matrix is then reinforced with low fusing green stick compound. The compound is heated in the Bunsen flame and small pieces are cut from the stick. These pieces are re-flamed and applied to both sides of the embrasure, using hard pressure. This forces the compound into the proximal. A warm spoon excavator is used to re-contour the matrix to assure proper contact and tooth form.

The type of alloy used is probably the least in importance as to factors influencing the qualities of amalgam. Any A.D.A. approved alloy will produce good results if properly handled, whether it be zinc or non zinc, fine or coarse cut. The trend however is toward a fine cut alloy. Phillips has shown that fine cut alloy will polish better and also has a better 24 hour strength. The eventual residual mercury content of an amalgam will influence its compressive strength more than any other factor. Phillips and Swartz found

(Continued on page 25)

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Applications for Membership

The following applications have been received by the Ethics Committee: Any member having information relative to any of the applicants, which would affect their membership, should communicate in writing with Milo R. Lunak, 5146 W. 25th St., Cicero 50.

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**WHY DO AMALGAM
RESTORATIONS FAIL?**
(Continued from page 20)

a serious loss in crushing strength in restorations containing in excess of 55% mercury. For example, with one commercial alloy, a compressive strength of 40,000 lbs. per square inch at a residual content of 55% dropped to only 18,000 lbs. per square inch when the mercury rose to 59%. 18,000 lbs. per square inch is not enough strength to resist normal occlusal biting stress. Only too often do we see restorations having a residual mercury content of over 55%.

Further studies by Eames have shown the crushing strength of amalgam to be even greater with a 46 to 50% mercury content. Using a mercury alloy ratio of 46 parts mercury to 54 parts alloy instead of the usual 8 to 5 ratio, automatically produces an amalgam with a mercury content less than 50%. This is referred to as a minimal mix and requires no wringing or mulling and is plastic enough to properly condense. Restorations made with this type of mix show crushing strength in excess of 20,000 pounds per square inch one hour and of 50,000 pounds per square inch in 24 hours consistently. Phillips and Swartz reporting on 100 restorations at random, found mercury to be present in quantities varying from 28.6 to 61.0%. Therefore, it is necessary to control accurately the original mercury alloy ratio. This particular variable need not and should not exist. By weighing the original mercury and alloy the residual mercury content may be kept

below 50%. It should be remembered that regardless of the wringing and condensation pressure, the more mercury used, the greater is the amount which will remain in the finished restoration. Dispensers should be consistent in proportioning alloy and mercury. They should be checked regularly with accurate scales to correct any error in the mercury alloy ratio.

The process of triturating amalgam has long been a topic of controversy. Most investigators now feel the apparent clinical physical changes attributed to over trituration are most often the result of moisture contamination, residual mercury content, or improper condensation. Expansion most certainly is due to moisture. Insufficient trituration will however insure many inferior properties. This results in a fast setting mass with little working time. The strength is low with marginal chipping inevitable. Greater corrosion is likely since some particles will not be combined with mercury. Certainly it is better to over triturate than under. Proper trituration of a minimal mix is accomplished only when the mass becomes one ball. Any less trituration time produces several small portions. These portions are crumbly and too dry for proper condensation. It is not necessary to use mechanical triturators but they do help standardize the procedure. Conditions present in each office dictate the trituration time. The size of alloy particles, speed of trituration, alloy mercury ratio, and type of amalgamator used are factors to consider in determining proper trituration time.



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As previously stated, the proper condensation of amalgam is of utmost importance in attaining the ultimate in an amalgam restoration. Good condensation of amalgam is as important to this procedure as condensation is to gold foil. Instrumentation, hand pressure, size of increments, and time are vital to amalgam condensation. A selection of plugger points, hand or automatic, should be available, which will fit into any portion of the cavity. A small round $\frac{1}{2}$ m.m. in size is indispensable for condensing into the retention grooves of a Class II. A diamond shape plugger is imperative in building the bulk of the proximal of a Class II, as this shape will allow entrance to all angles of the preparation. Slightly larger round pluggers are necessary for the occlusal portion. Every portion of amalgam placed in the cavity should be thoroughly condensed. The mere pushing of alloy from one portion of the preparation to the other will not do the job. This results in voids along with a mass which is not equally hard throughout. The amalgam should be stepped like foil and introduced in small increments. Each increment should be condensed until mercury is brought to the surface. Each increment should have the same mercury content and no one mix should be used over three minutes by the clock. Several mixes must be employed for large restorations. Amalgam used over three minutes has started to set which makes it impossible to condense properly. All cavities should be over filled to at least one m.m.

access over the margins. Unvulcanized rubber is used to finally remove any mercury rich material left on the surface. By over filling sufficient stock is provided for carving and the removal of the surface mercury rich material will not leave margins uncovered with amalgam.

No sharp anatomy is carved in amalgam. This definitely weakens the restoration both marginally and interproximally. Shallow rounded anatomy is much preferred and is best done with a number one Walls carver. The marginal ridge is shaped with Orban's gingivectomy knives. The angulation and thinness of these knives make the trimming of proximal flashes an easy matter. An excess of amalgam is left over all occlusal margins wherever possible. This provides stock for polishing and finishing the amalgam.

To not polish an amalgam restoration is to leave a restoration only two thirds finished. Unpolished amalgams will corrode with eventual pitting. The excess amalgam over the margins will chip leaving a so called "ditched filling." These margins are subject to recurrent caries and subsequent failure. Caution must be exercised during the polishing procedure as to not overheat the restoration. Mercury is brought to the surface with heat which weakens the restoration and prevents a lasting polish. Round burs of various sizes are used to finish the amalgam to the margins and smooth the anatomy. Burs create little heat and the enamel is not cut as would likely be the case with stones. Robinson brushes in the

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straight handpiece along with very wet pumice are used to remove the bur marks. Wet pumice is necessary to prevent overheating. The proximals are polished to the extent the Robinson brushes will reach. The final polish is done with wet tin oxide and prophylactic brushes.

Most of the fundamental principles presented today are not new. An attempt has been made to review that which has been taught and practiced by Hollenbeck, Sweeney, Miller, Markley and others for many years. G. V. Black advocated these same teachings over 50 years ago. There have been a few modifications and changes in techniques over Black's concepts of a half century ago. However, most of his concepts remain sound, as they have yet to be disproven. True, there has been a great deal of research done on amalgam over the last twenty-five years and there is yet much unknown concerning the chemistry and variables involved in its manipulation. Great strides have and are being made toward a more thorough understanding of this most commonly used of all restorative materials. For example, recent work with radioactive isotopes has shown that no restorative material has perfect marginal adaptation. Leakage may be demonstrated with all. Less has been observed with amalgam than with any other restorative material, and the penetration apparently decreases with age. This is a highly desirable property. This fact alone should make the use of amalgam, along with sound procedures, imperative to all.

APPLICANTS

(Continued from page 21)

BUNTAIN, JAMES R. (Northwestern 1958) North Suburban, 1604 Chicago Ave., Evanston. Endorsed by Robert E. Koch and Floyd E. Grover.

BURKHARDT, FRED E. (Illinois 1958) Northwest Side, 6027 Addison St. Endorsed by E. H. Jaeger and T. R. Ferguson.

FAFINSKI, JOHN S. (Loyola 1956) Northwest Side, 1212 N. Ashland Ave. Endorsed by M. V. Kaminski and J. C. Chyrek.

GRANATA, JOSEPH J. (Illinois 1956) North Suburban, 747 Deerfield Rd., Deerfield. Endorsed by Frank S. Seifried and A. J. Skupa.

HEISNER, NORMAN F. (Illinois 1960) West Suburban, 403 Main St., Glen Ellyn. Endorsed by Gordon A. Glaysher and Eugene R. Grandel.

KATZ, MARVIN J. (Northwestern 1960) North Suburban, 512 Golf Mill Shopping Center, Niles. Endorsed by Jules B. Altenberg and B. P. Davidson.

KOSTINA, DALE K. (Loyola 1960) West Suburban, 6720 W. Ogden Ave., Berwyn. Endorsed by Arthur B. Siml and Wm. P. Schoen, Jr.

KOSTRUBALA, BART J. (Loyola 1958) Englewood, 5053 S. Damen Ave. Endorsed by Roman A. Urban and Norbert J. Mann.

LUSWICK, EDWARD J. (Loyola 1960) North Suburban, 101 S. Pine St., Mt. Prospect. Endorsed by George J. Matousek and Arthur J. Krol.

MORA, BURTON (Northwestern 1957) North Suburban, 8820 N. Bronx, Skokie. Endorsed by Samuel N. Narsette and Lawrence L. Golden.

MOSELEY, EDGAR T. (Northwestern 1934) North Side, 2742 N. Clark St. Endorsed by H. F. Fehr and K. S. Khedroo.

ROSE, HOWARD A. (Illinois 1960) North Suburban, 1893 Sheridan Rd., Highland Park. Endorsed by Marvin B. Weiss and Theodore H. Kurtz.

ZIDEBK, FRANK O. (Marquette 1959) West Suburban, 3504 Grand Blvd., Brookfield. Endorsed by Francis M. Higgins and Sol Goldman.

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NEWS OF THE BRANCHES

(Continued from page 16)

very profitable evening. Our next Kenwood-Hyde Park meeting date will be Tuesday, March 7th, at the usual place, Arnold and Eddie's. Come for dinner and later we will hear Dr. Charles Elliott, Professor of Clinical Speech Pathology at the University of Illinois, who will speak on a subject most important to us as dentists, "Semantics." Don't miss this one. . . . Bob Pinkerton visited his son in Long Beach, California. Bob flew Jet so that he could hurry to get away from this cold and of course, to see his son; also to join his wife, who left a few days before him. Bob's son, as you all know, is a dentist with the Navy and will leave for a six to eight months' cruise. . . . Here is another bit of news for the A.S.D.C.—The American Society of Dentistry for Children. "Membership in the Illinois Unit of American Society of Dentistry for Children is open to all members of the profession." Membership for the current years is \$15.00. Checks may be sent to Dr. William Rogers, Treasurer, 3233 South Park, Chicago 16, Illinois. . . . By the way, it isn't Hal Block who is moving to the Windsor Medical Building at 7265 Exchange Ave.; it's Hal Black. Sorry for the typographical error. Hal Block didn't like it, neither did Hal Black. . . . Keep well and happy.—Morton J. Fireman, Branch Correspondent.

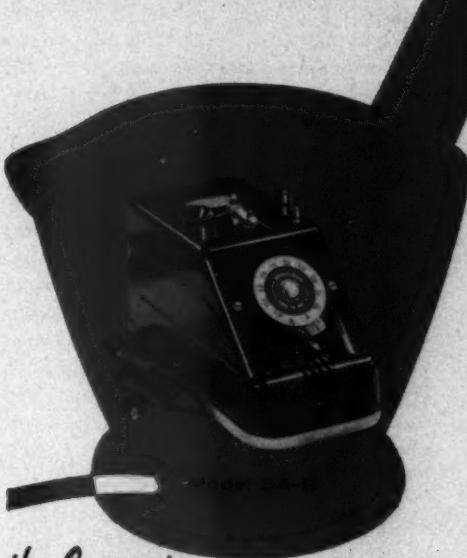
Northwest Side

At a recent meeting of the members' group at Alf Altern's on Tuesday, Jan. 24th, were many of the most active members in the Northwest Side Branch. Notably present were Joe Zielinski, Ted Serr, Ray Rux, Joe Ulis, Cliff Lossman, Tom Wright, and last but not least, Mark Spencer. A word has to be said about Mark Spencer who certainly is one of our most active and most liked members. Mark confided to me that he felt that he was somewhat misplaced in the news department of the Branch column, especially in regard to his recent trip to

Florida. Well! Mark, all I can say is that I am sorry about this apparent oversight on my part which I hope to rectify at this time. In further discussion I learned that there are some areas in Florida that Mark claims are downright unsafe for the motorist because of the elderly population who are permitted to drive. Just to play it safe, Mark decided to walk, and it wasn't long before he found out that they have jaywalking ordinances in Florida, for which he was politely given a ticket. Please, Mark, don't take it out on the elderly as time stands still for no one. . . . Johnnie Gates, Herman Wenger, and Joe Zielinski just returned from Peoria where they attended the annual business meeting of the State Dental Society on January 17, 18, and 19. Rumor has it that Herman Wenger is planning on a retirement program for himself. I received a card a few weeks ago from Bob Placek who is an expert on all the facets of retirement. His advice is to save all your amalgam scrap so that you too can spend those cold winter days in Florida and Jamaica. Bob sent me a beautiful card from Florida depicting life on the sunny beaches and also sends his regards to all of the boys. . . . I hear that Clayton Crane's dog, Jiggs, won't have to sit up and beg for his dog biscuits anymore or not for awhile anyway. It seems that Jiggs was the lucky holder of a \$100 pool ticket on the recent Rose Bowl game or so the winning ticket said. . . . It is with regret that I have to report the passing of Andy Mitran after a brief illness. I did not know Andy personally, but those with whom I talked accepted his passing as a great personal loss, as he was well liked by all who knew him. To his wife, Carol and children, we can only say that we in the Branch too, feel a loss in his passing. . . . There is nothing more to be said at this time, and I am therefore closing this column.—Chester L. Jasick, Branch Correspondent.

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**MODERN CONCEPTS IN SURGICAL
PREPARATION OF THE
EDENTULOUS MOUTH**

(Continued from page 11)

percentage of cases, the bone of the mandible is unable to withstand the stresses of mastication transmitted to it directly by these dental implants. Consequently, resorption due to stress occurs¹⁷. Once this resorption starts, the semi-buried implant is no longer absolutely immobile. It is a well-established principle of implantation that stress-bearing implants must be immobile¹⁸. The least bit of mobility rapidly increases the resorption of bone. This, in turn, further increases mobility and the vicious cycle revolves progressively faster. This expensive, laborious technic is indicated for select cases and must be limited to a highly skilled team of prosthodontist, surgeon, and laboratory technician¹⁹.

Behrman Magnetic Implant

Another implant technic, one which observes all of the principles of implantation, is the Behrman Magnetic Implant²⁰. Tiny, powerful, tissue-tolerated magnets ($\frac{1}{4} \times \frac{1}{8} \times \frac{1}{8}$ inches in size) are placed in "vaults" in the bone and covered completely by mucoperiosteum. Similar magnets are placed in an otherwise conventional full denture. The attraction between the magnets in the jaw and the magnets in the denture helps hold the denture in place. The surgical technic¹ is a simple one, taking approximately twenty minutes per side: (1) The mucoperiosteum is incised sharply from the molar area to the bicuspid area. (2) The mucosa and periosteum are carefully reflected and retracted with four retracting sutures in each flap. (3) By means either of the conventional dental engine, (using #6, 8, and 10 burs) or the air-turbine high-speed drill, a vault is prepared in the mandible. The broadest, flattest portion of the jaw is selected (usually the first or second molar area); the vault measures approximately $\frac{1}{4}$ inch in length, $\frac{1}{8}$ inch in width and $\frac{1}{8}$ inch in depth. (4) The Denture Magnet is used as a guide to determine the proper depth of the vault.

This is obtained when the superior portion of the magnet is flush with the level of the bone. (5) A small rectangle of mesh comes attached to the Implant Magnet in order to suspend the Magnet in position in the vault. This mesh is trimmed so that several millimeters overlap the bony margins of the vault. (6) The mucoperiosteum then is sutured closed.

One month following surgery a conventional set of full dentures is made. (It is suggested that the posterior flanges be made in clear acrylic.) Magnets are placed in these dentures in a very simple fashion¹: (1) The lower denture is removed from the mouth. A magnet is placed on the posterior portion of the alveolar ridge. It will be attracted to the magnet in the jaw and will always assume its correct position. (2) The mesial and distal aspects of the magnet are marked on the buccal mucosa. (3) The magnet is removed and the denture is seated. The markings are transferred to the denture. (4) A window, larger than the indicated markings, is cut through and through the buccal flange of the denture. The peripheral border is left intact. (5) The denture is placed in the mouth and the magnet placed in the window. It is observed carefully to make certain that the magnet is not touching any portion of the denture material. If it is touching the denture in any place, more material is removed in this area. (6) When the magnet is seated over the magnet in the mandible and is completely free of contact with the denture, self-cure polymer powder is placed in the window. (7) The patient closes in centric occlusion and several drops of polymer are added. The patient remains in centric occlusion until the material has set. (8) The denture is removed from the mouth and defects in the under surface are corrected by means of the brush technic as if the patient were having a re-line. Upon completion, the under-surface of the magnet should be an integral part of the under-surface of the denture.

Histological, clinical, and roentgenographic follow-up over an eight-year period has indicated: (1) No adverse micro-

scopic tissue reaction. (2) No gross tissue reaction whatsoever. (3) No roentgenographic indication of any intolerance or any increased bone resorption. It has been found that these magnets are so well tolerated by the tissue that bone actually grows around the rounded edges of the implants. In order to remove several for histological study, it was necessary to free them from the bone by means of chisels and burs. This simple, inexpensive and effective technic, which observes every principle of implantation²¹, appears to be withstanding the test of time.

Summary

In summation, we must be cognizant of the fact that any surgical procedure, whether it be the removal of a tooth or the insertion of an implant, must be based on the concepts that: (1) This patient probably will live longer than a patient the same age would have, ten or twenty years ago, and (2) that there are certain principles of surgery affecting healing, scarring, bone resorption, etc. Only by complete consciousness of these concepts can we provide our patients with the health service of which our profession is capable.

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